DINOSAURS!

DISCOVER THE GIANTS [illegible] RIC WORLD

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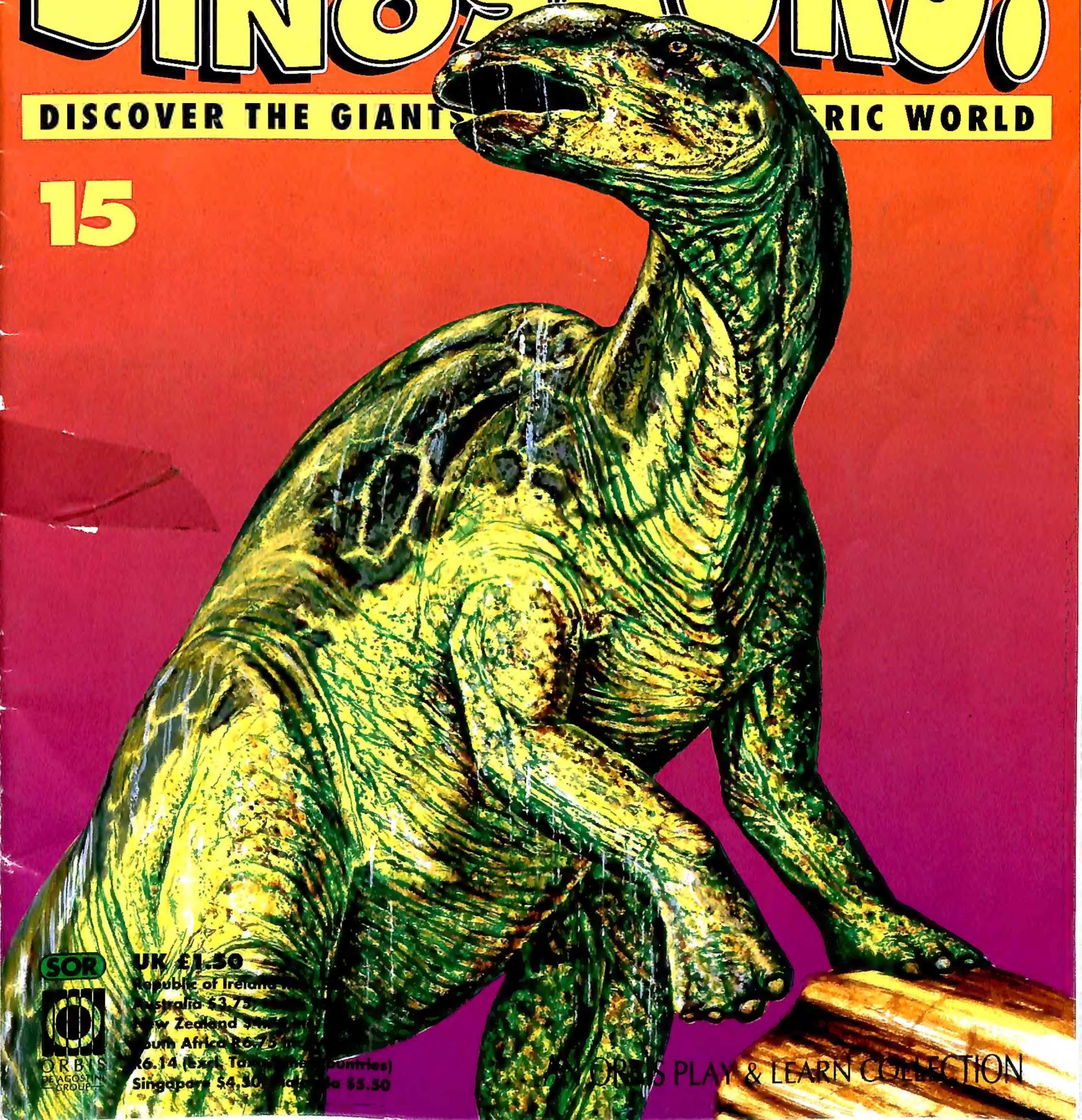

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DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •

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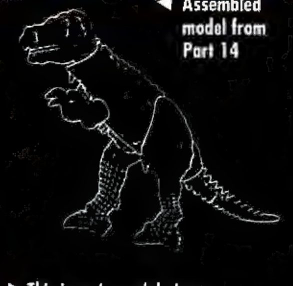
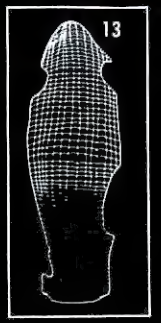
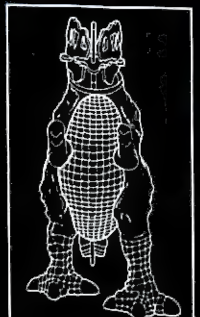


◀ Assembled model from Part 14

▶ This issue's model piece Model part 13– under body



Turn your dinosaur over on to its back. Slot Model part 13 into the space between the dinosaur's legs to cover up the skeleton. Push in to secure.



◀This issue's assembled model

▲ Your complete T rex model

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ANATOTITAN

With no claws, spikes or big teeth to protect it from predators, *Anatotitan* probably escaped into deep water.

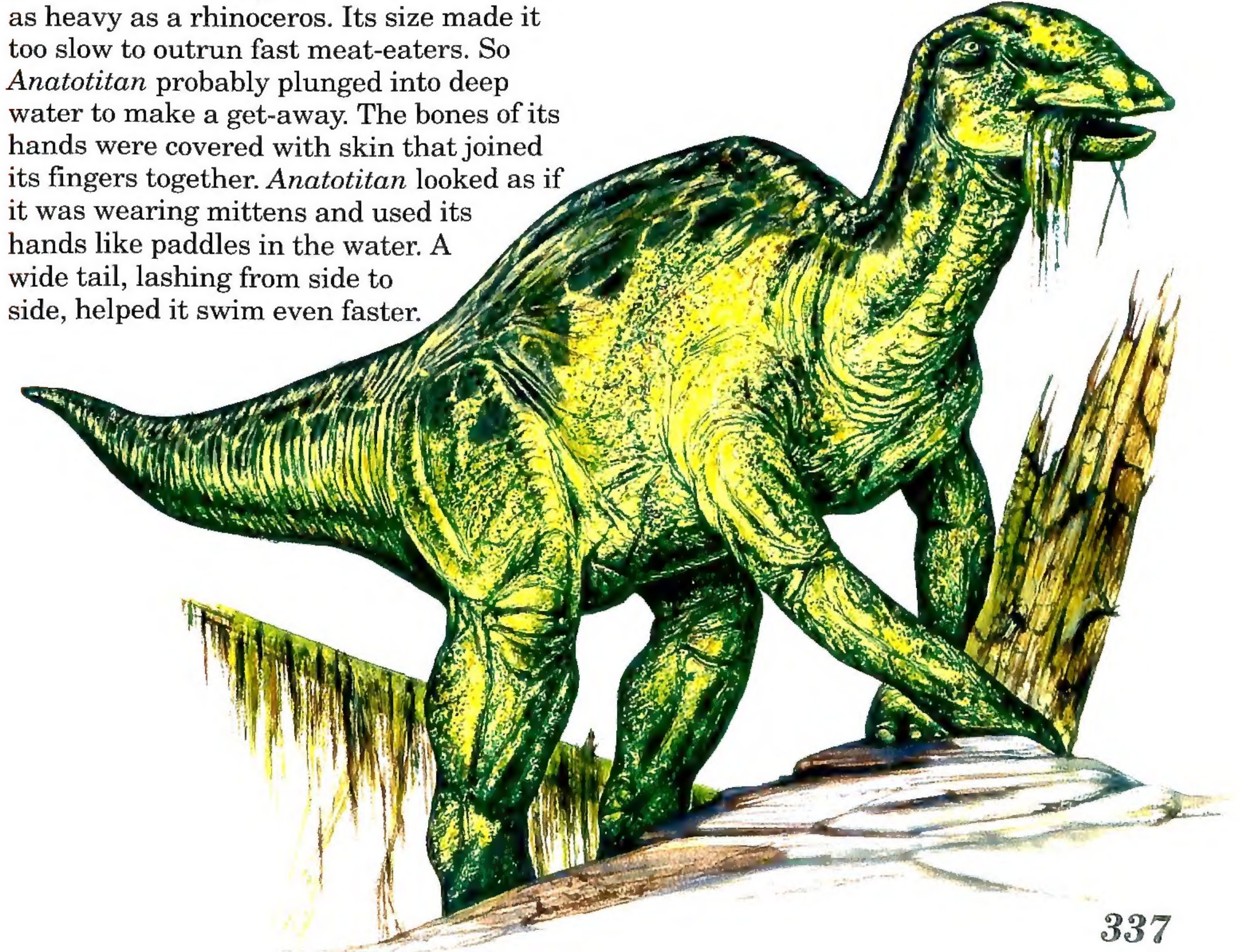
Because *Anatotitan* lived in fertile lowland areas, it had lots of juicy shrubs to feed on. Swamps and rivers were dotted about the land, but *Anatotitan* preferred to look for food on solid ground.

PADDLE HANDS

Anatotitan was longer than three cars and as heavy as a rhinoceros. Its size made it too slow to outrun fast meat-eaters. So *Anatotitan* probably plunged into deep water to make a get-away. The bones of its hands were covered with skin that joined its fingers together. *Anatotitan* looked as if it was wearing mittens and used its hands like paddles in the water. A wide tail, lashing from side to side, helped it swim even faster.

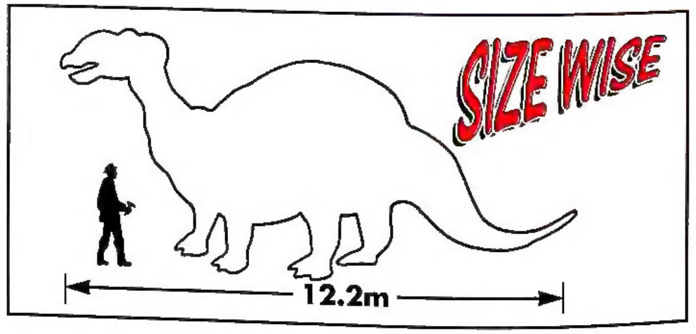
BROAD BEAK

With its wide, toothless, duck-like bill, *Anatotitan* could scoop up big mouthfuls of plants. Tough twigs were neatly nipped off by the edge of its beak, which was sharp and horny like a turtle's. Further back in its mouth, up to 1000 strong teeth helped *Anatotitan* munch the twigs and cones until they were soft enough to swallow. Unlike some hadrosaurs, this dinosaur did not have a head crest. Its snout took up half the length of its low, flat head.



DIAMOND TEETH

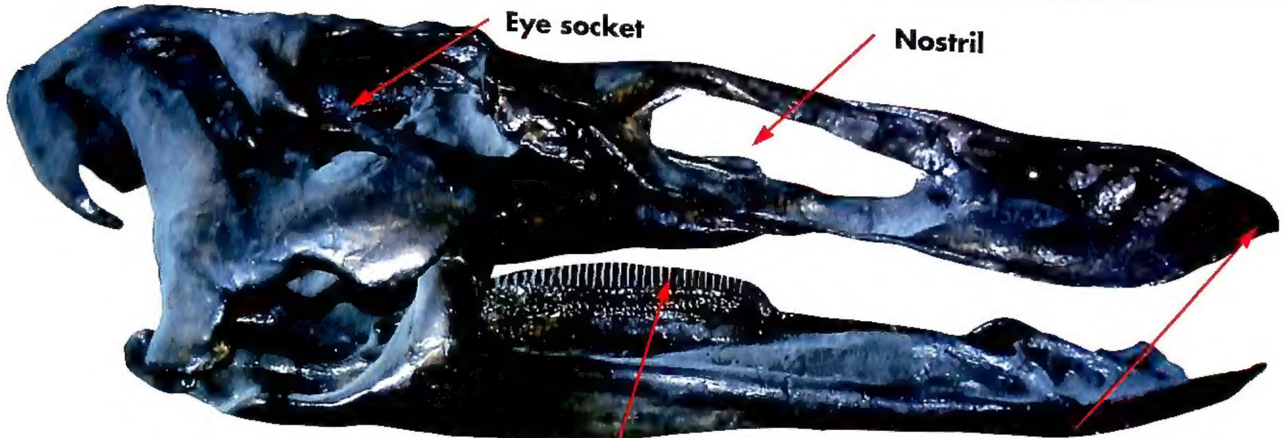
Anatotitan had small, diamond-shaped teeth. On their own they look weak and feeble. But inside *Anatotitan's* cheeks, hundreds of these little teeth were fused together by a sort of bony cement. This created an immensely strong grinding surface, which worked like a millstone to crush tough conifer twigs and seeds.



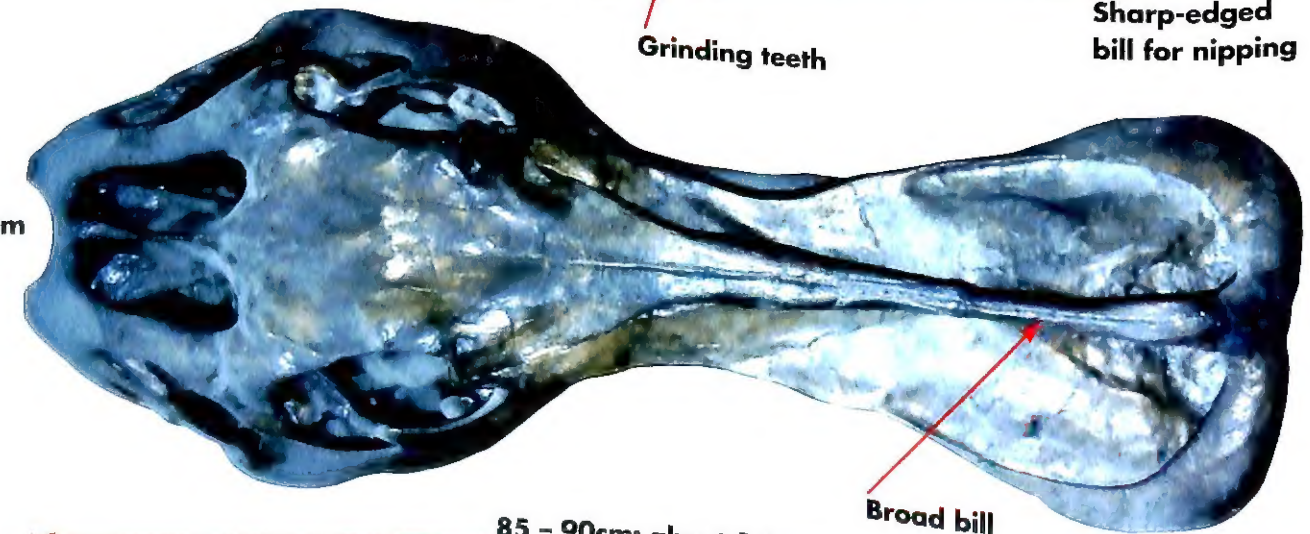
MONSTER FACTS

- **NAME:** *Anatotitan* (a-nat-oh-tite-an) means 'giant duck'
- **SIZE:** up to 12.2m long
- **FOOD:** plants, leaves, twigs and cones
- **LIVED:** about 75 million years ago in the Late Cretaceous Period in North America

Today's ducks use their bills to nip at plants, too. The skull (below) shows how *Anatotitan* got its name – 'giant duck'.



Skull from the side



Skull from above

85 - 90cm: about 3 times the height of this page

PUFFED UP

Like the hadrosaur *Saurolophus*, *Anatotitan* did not have a tubular head crest. Instead, it had shallow dents in the sides of its face. It is possible that *Anatotitan* was able to puff up these pouches, like an elephant seal inflates its snout. The result was probably a loud noise to warn off intruders.

Is it true that hadrosaurs 'talked' to each other?

Some hadrosaurs had flaps of skin that could be blown up like a balloon. Others had crests like hollow tubes. Usually, these were attached to nostrils and so the dinosaurs could make amplified noises or calls. They could use the sound to scare off rivals. Or it may have been the dinosaurs' way of saying 'hello'!

STRONG SENSES

Anatotitan spent most of the time on land and could not always rely on plunging into water to escape predators. It was an intelligent creature and used its well-developed senses to stay alert to danger. *Anatotitan* had large eyes and could probably spot a stalking predator some distance away. It also used its good sense of hearing as another early warning device. Some scientists believe that hadrosaurs had an acute sense of smell, too.

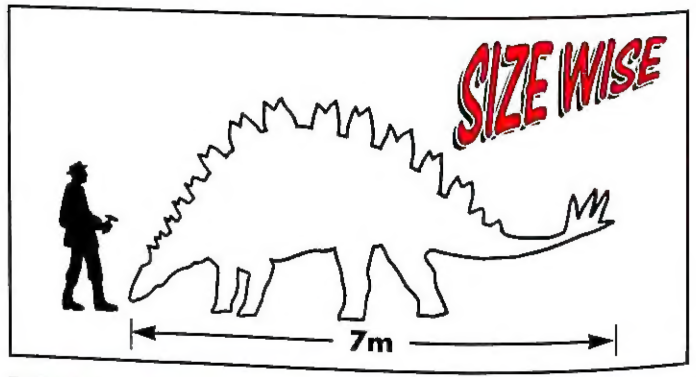
TRACK CLUES

Anatotitan may have found safety in numbers. There is evidence to suggest that hadrosaurs moved in groups or herds. By looking at footprints and the direction of tracks, scientists have found that large numbers of the same family of dinosaur moved together at the same time. *Anatotitan* probably lived and travelled across land in the safety of a herd.

TUOJIANGOSAURUS

With pointed plates and a spiked tail, peaceful *Tuojiangosaurus* looked much fiercer than it really was.

Tuojiangosaurus lived in China at about the same time that its spiky relative *Stegosaurus* was living in North America.



MONSTER FACTS

- **NAME:** *Tuojiangosaurus* (too-oh-yang-oh-saw-rus) means 'Tuojiang reptile'
- **SIZE:** 7m long and about 2m high
- **FOOD:** low-lying plants
- **LIVED:** about 150 – 140 million years ago in the Late Jurassic Period in China

POINTED PLATES AND TAIL SPIKES

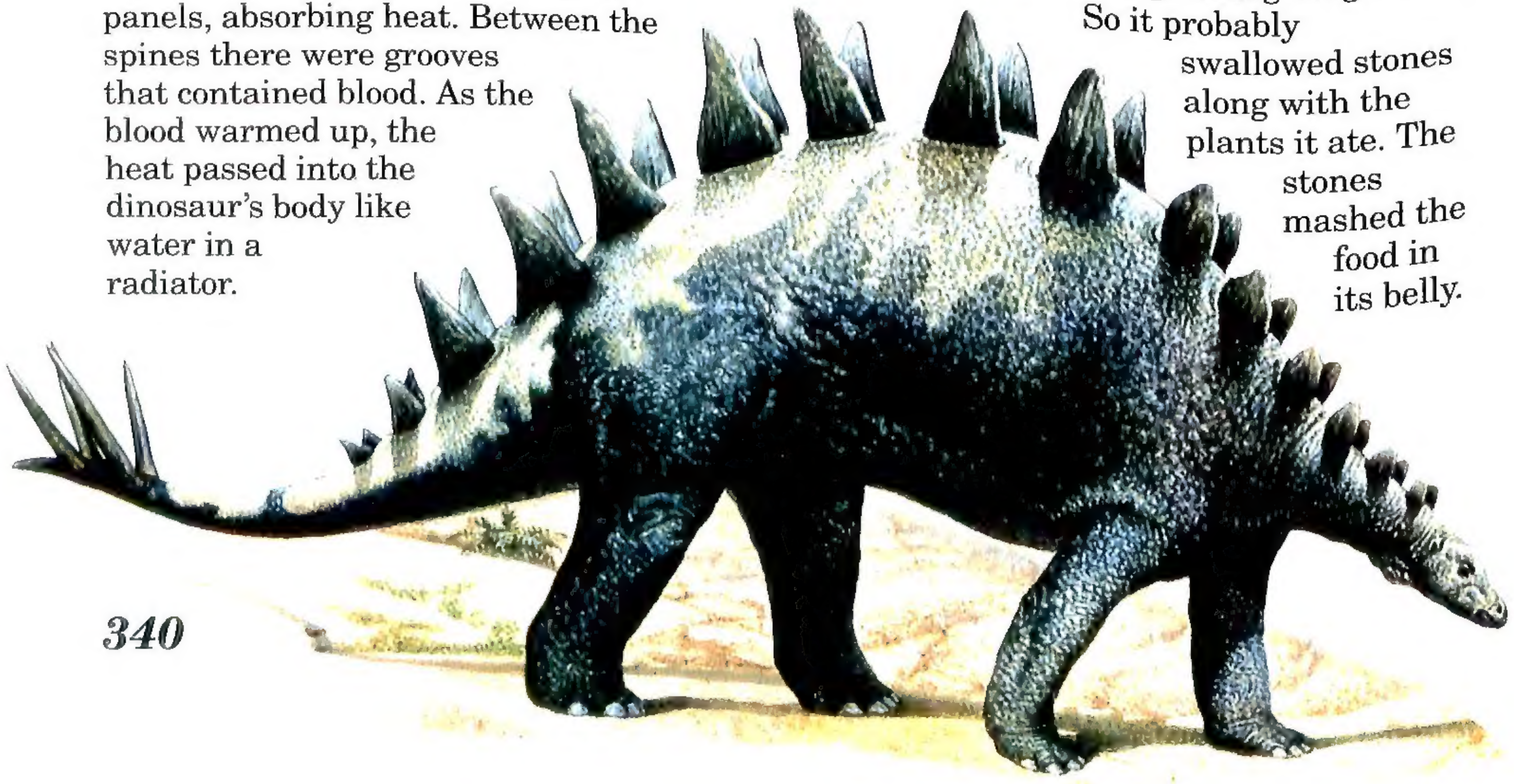
Along its neck, back and tail, *Tuojiangosaurus* had 15 pairs of cone-shaped plates. Spikier than *Stegosaurus'* plates, they were used to fend off *Tuojiangosaurus'* enemies. At the end of its short, muscular tail, it also had two pairs of sharp spikes that pointed upwards. This dinosaur used its tail to swipe any meat-eater that came too near.

SOAKING UP THE SUN

Can you imagine a dinosaur sunbathing? *Tuojiangosaurus'* spines were used to soak up the sun. They worked like solar panels, absorbing heat. Between the spines there were grooves that contained blood. As the blood warmed up, the heat passed into the dinosaur's body like water in a radiator.

STOMACH STONES

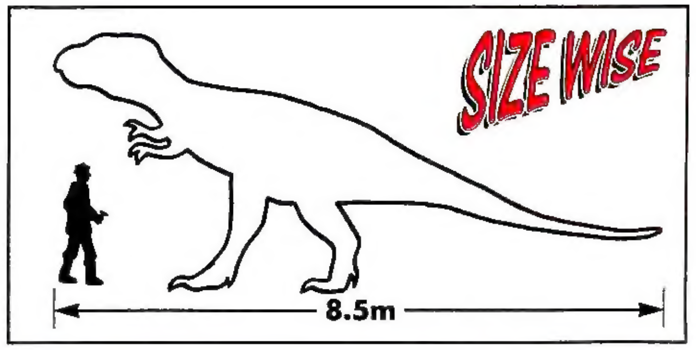
Tuojiangosaurus had weak teeth that were no good for grinding tough food. So it probably swallowed stones along with the plants it ate. The stones mashed the food in its belly.



DASPLETOSAURUS

This fearsome two-legged meat-eater opened its huge jaws and killed its prey in one deadly rush.

Daspletosaurus was longer than a coach and had a massive head. Like *Tyrannosaurus,* its arms were tiny compared with the rest of its body. *Daspletosaurus* walked on its strong back legs. It took long strides, so it moved quite fast in spite of its size.



MONSTER FACTS

- **NAME:** *Daspletosaurus* (da-spleet-oh-saw-rus) means 'frightful reptile'
- **SIZE:** 8.5m long
- **FOOD:** meat, especially other dinosaurs
- **LIVED:** about 80 million years ago in the Late Cretaceous Period in Alberta, North America

SURPRISE ATTACK

As its body was so heavy, *Daspletosaurus* used its speed in short bursts and relied on surprise to catch prey. It lurked about in the shadows of trees until it spotted a likely victim, such as the horned dinosaur *Styracosaurus*. Then *Daspletosaurus* leapt out and ambushed its prey.

HEADING THE SHOCK

Daspletosaurus rushed at its prey with wide-open jaws. The dinosaurs collided with a colossal thump. *Daspletosaurus'* gigantic head had to take the shock of the impact. Special hinges inside its jaws gave it extra flexibility and protected the bones in its skull from damage.

OUT FOR THE COUNT

Once the victim was stunned, *Daspletosaurus* sank its teeth into the soft flesh. The tight grip of the attacker's jaws made escape impossible. It was only a matter of time before the victor was enjoying the spoils.

Last of the pterosaurs

Before they died out, pterosaurs had evolved into the strangest and biggest flying creatures ever to live on Earth.

Pterosaurs died out 66 million years ago, along with the dinosaurs and many other animals. The long-tailed pterosaurs all died out at the end of the Jurassic, but the short-tailed pterosaurs, the pterodactyloids (tare-oh-dak-til-oids), survived and went from strength to strength.

THE CHANGING WORLD

After the Jurassic came the Cretaceous Period. It was warmer and sea levels rose to cover much of the land. Continents slowly drifted across the globe, crashed into each other and gradually formed huge mountain ranges.

SHORT TAILS' SUCCESS

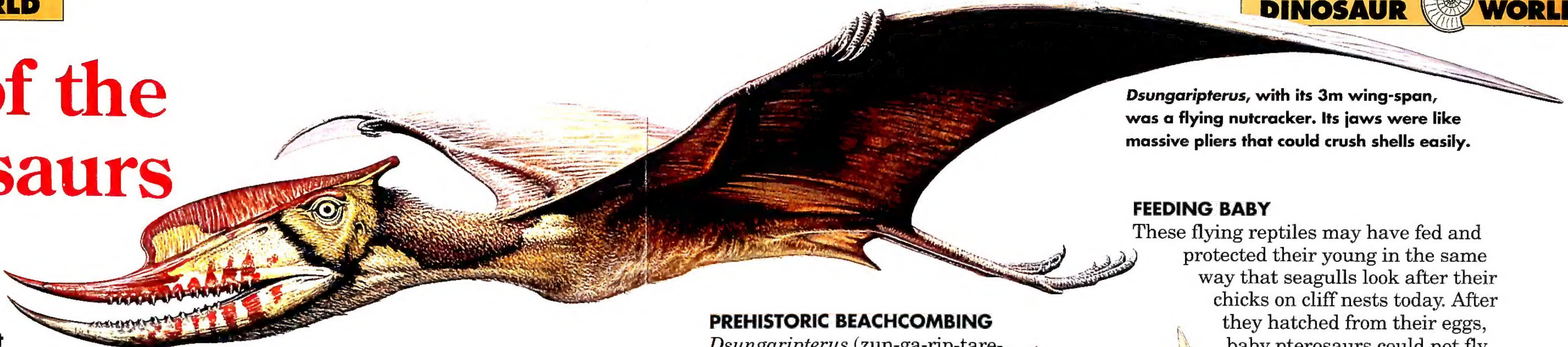
The pterodactyloids ('wing-fingered pterosaurs') made the most of these new conditions. There were many different kinds of pterodactyloid pterosaur, but they all had two things in common – short tails and long, narrow wings. From far away, they must have looked like soaring seabirds such as gulls and albatrosses. In fact, during the Cretaceous Period, birds were becoming more common. For a time, they shared the skies with the pterosaurs.

BIGGER AND BETTER

Pterodactyloids grew larger during the Cretaceous Period. They also became better at flying and gliding. To save energy, they glided huge distances without flapping their wings. Warm air currents blowing up hillsides and mountains carried some pterodactyls along, just like hangliders today. Others glided over the vast oceans and developed strange beaks for feeding on plankton (minute sea creatures), fish or seashore shellfish.

Is it true that pterosaurs had warm blood?

Most reptiles are cold-blooded. They have to wait for the sun to warm their bodies, so that their muscles can work. Birds and mammals are warm-blooded. Their bodies make their own warmth by using energy in the food they eat, so they can always be active. Two clues indicate that pterosaurs were warm-blooded. They must have carried out complicated flying manoeuvres. These needed active muscles and a big brain, which work best only when warm. Also, many fossils clearly show that pterosaurs were furry. Fur has few other uses, except to keep its owner warm!



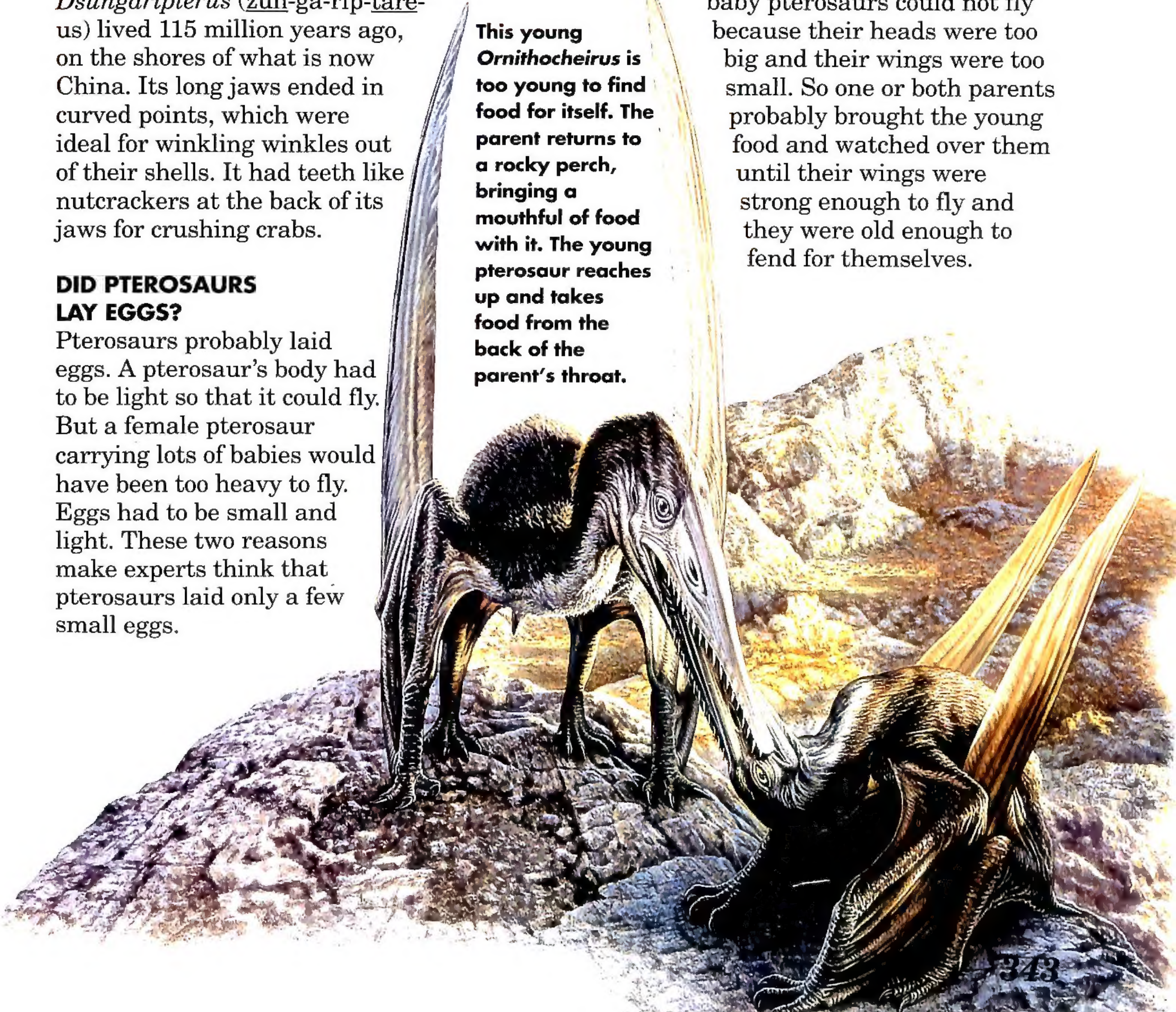
***Dsungaripterus*, with its 3m wing-span, was a flying nutcracker. Its jaws were like massive pliers that could crush shells easily.**

PREHISTORIC BEACHCOMBING

Dsungaripterus (zun-ga-rip-tare-us) lived 115 million years ago, on the shores of what is now China. Its long jaws ended in curved points, which were ideal for winkling winkles out of their shells. It had teeth like nutcrackers at the back of its jaws for crushing crabs.

DID PTEROSAURS LAY EGGS?

Pterosaurs probably laid eggs. A pterosaur's body had to be light so that it could fly. But a female pterosaur carrying lots of babies would have been too heavy to fly. Eggs had to be small and light. These two reasons make experts think that pterosaurs laid only a few small eggs.



This young *Ornithocheirus* is too young to find food for itself. The parent returns to a rocky perch, bringing a mouthful of food with it. The young pterosaur reaches up and takes food from the back of the parent's throat.

FEEDING BABY

These flying reptiles may have fed and protected their young in the same way that seagulls look after their chicks on cliff nests today. After they hatched from their eggs, baby pterosaurs could not fly because their heads were too big and their wings were too small. So one or both parents probably brought the young food and watched over them until their wings were strong enough to fly and they were old enough to fend for themselves.

***Tropeognathus* lived in what is now Brazil and had 28 spiky teeth. Only two *Tropeognathus* have ever been found. One had a wing-span almost twice as wide as today's albatross.**

THE FLYING FISHER

Tropeognathus (trop-ee-og-nath-us) was one of the strangest pterosaurs. It was big, too, with a 6.2m wing-span. Its name means 'keel-jaw', and it was called this because its beak was made up of two parts, each like the keel of a yacht, one on the top, the other on the bottom. Sharp teeth stuck out from the sides. This weird design probably helped *Tropeognathus* to snap up food. The keels on its beak helped it cut through the water, just as the keel of a yacht helps it move fast. The pterosaur would fly low over the waves, cutting through the surface of the water with its beak to catch fish and squid.

THE BIGGEST OF THE BIG

One of the last pterosaurs was the spectacular *Quetzalcoatlus* (kwet-zal-coat-lus), named after the traditional Mexican feathered snake-god Quetzalcoatl. This huge creature, its head longer than a man, was probably as big as a flying animal could ever be. It adapted to the place in which it lived. *Quetzalcoatlus* was so big that it could not have taken off without help from the winds whistling through the mountains and canyons of Texas, USA. Once in the air, it could glide on the air currents for a long time.

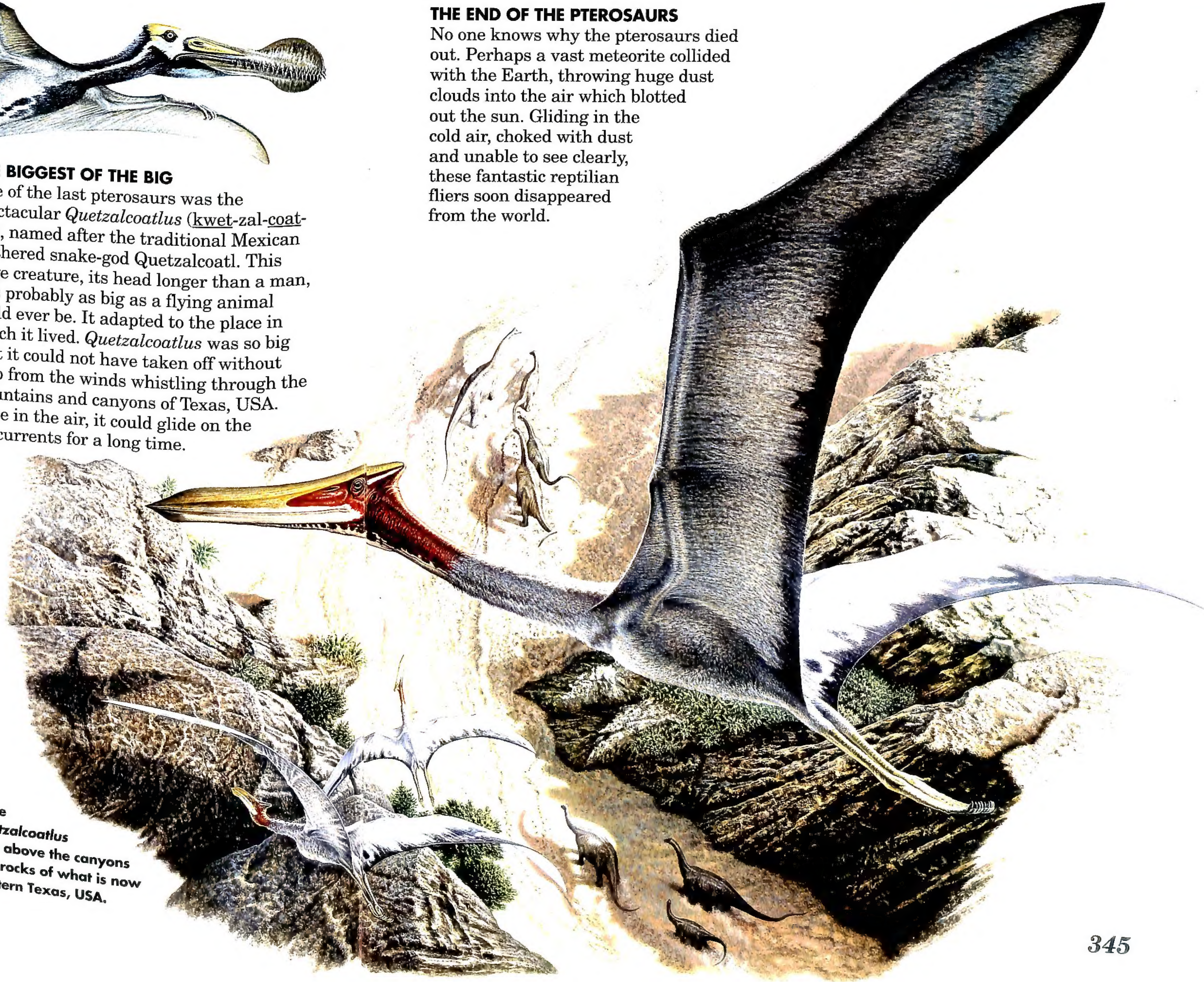
IT'S A FACT

PTEROSAURS AROUND THE WORLD

After a slow start, fossil-hunters began to find pterosaur fossils on every continent, except Antarctica. So these winged reptiles must have lived all over the world. Lots of the fossils are beautifully preserved. This is because many pterosaurs flew along coasts and over the sea. When they died, their bodies were quickly buried in the mud and sand, and gradually turned to rock.

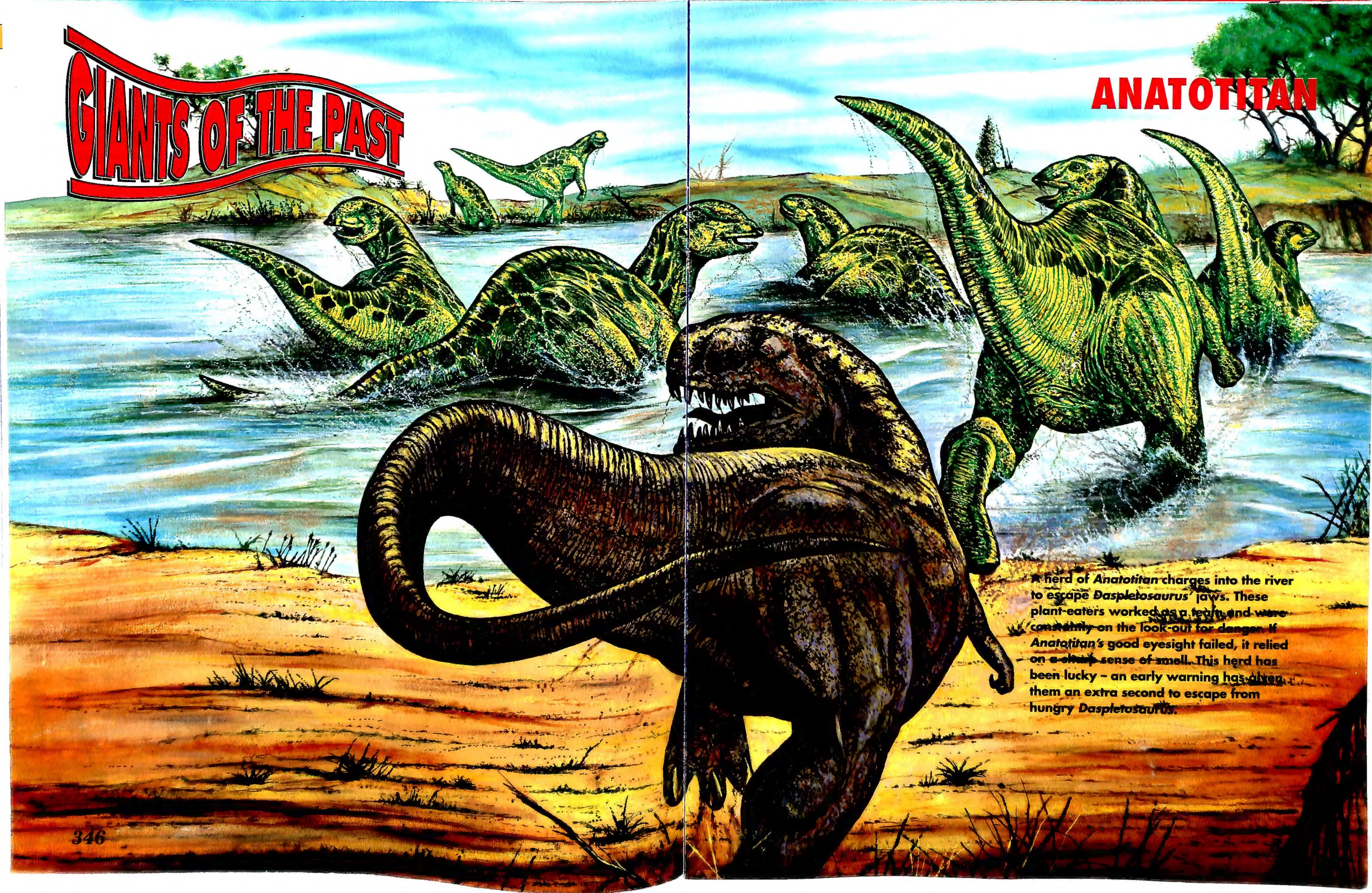
THE END OF THE PTEROSAURS

No one knows why the pterosaurs died out. Perhaps a vast meteorite collided with the Earth, throwing huge dust clouds into the air which blotted out the sun. Gliding in the cold air, choked with dust and unable to see clearly, these fantastic reptilian fliers soon disappeared from the world.



Three *Quetzalcoatlus* soar above the canyons and rocks of what is now western Texas, USA.

ANATOTITAN



A herd of *Anatotitan* charges into the river to escape *Daspletosaurus'* jaws. These plant-eaters worked as a team and were constantly on the look-out for danger. If *Anatotitan's* good eyesight failed, it relied on a sharp sense of smell. This herd has been lucky – an early warning has given them an extra second to escape from hungry *Daspletosaurus*.

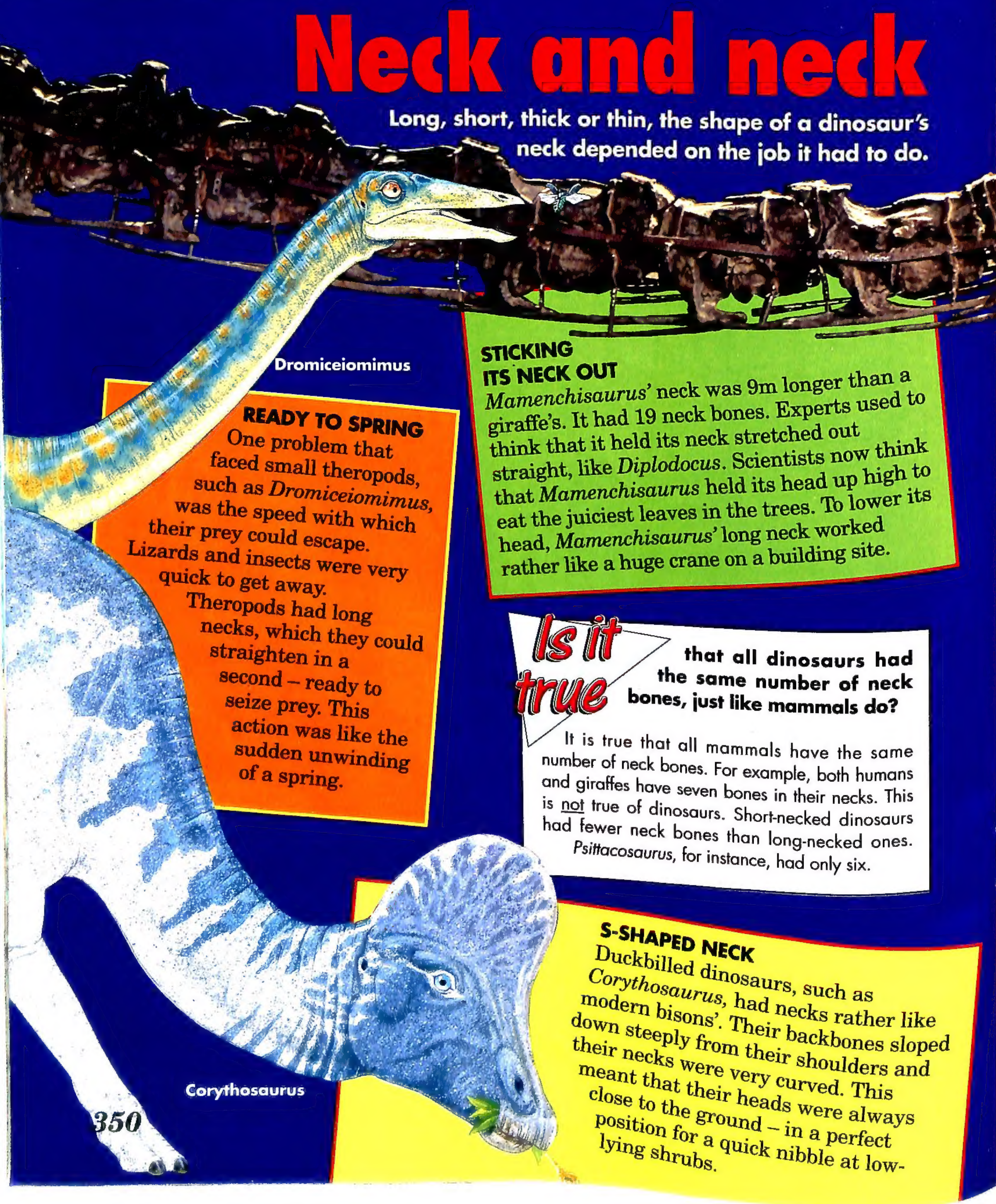
3-D Gallery

GALLIMIMUS

- Tall, ostrich-like dinosaur
- Lived 70 – 66 million years ago in southern Mongolia
- Measured 4m long
- Ate eggs, plants, insects, lizards

Neck and neck

Long, short, thick or thin, the shape of a dinosaur's neck depended on the job it had to do.



READY TO SPRING

One problem that faced small theropods, such as *Dromiceiomimus*, was the speed with which their prey could escape. Lizards and insects were very quick to get away. Theropods had long necks, which they could straighten in a second – ready to seize prey. This action was like the sudden unwinding of a spring.

STICKING ITS NECK OUT

Mamenchisaurus' neck was 9m longer than a giraffe's. It had 19 neck bones. Experts used to think that it held its neck stretched out straight, like *Diplodocus*. Scientists now think that *Mamenchisaurus* held its head up high to eat the juiciest leaves in the trees. To lower its head, *Mamenchisaurus*' long neck worked rather like a huge crane on a building site.

Is it true that all dinosaurs had the same number of neck bones, just like mammals do?

It is true that all mammals have the same number of neck bones. For example, both humans and giraffes have seven bones in their necks. This is not true of dinosaurs. Short-necked dinosaurs had fewer neck bones than long-necked ones. *Psittacosaurus*, for instance, had only six.

S-SHAPED NECK

Duckbilled dinosaurs, such as *Corythosaurus*, had necks rather like modern bisons'. Their backbones sloped down steeply from their shoulders and their necks were very curved. This meant that their heads were always close to the ground – in a perfect position for a quick nibble at low-lying shrubs.

Dinosaurs' necks helped the animals to wrench raw meat off the bone, reach up for the juiciest leaves on a tree-top, fight a rival or stop an enemy attack.

PAIN IN THE NECK?

Reinforced bones in their necks prevented pachycephalosaurs from damaging themselves during head-butting contests. The skull of *Stegoceras* shows where extra-strong muscles joined its head to its neck. The neck acted like a shock absorber.

The veins in *Albertosaurus'* neck (below) stand out as the predator uses its neck muscles to twist and pull flesh from *Edmontonia*. The solid collar of bony plates around *Edmontonia's* neck meant that a predator had to flip the armoured dinosaur over to reach the fleshy underneath of its neck.

TEARING AND TURNING

Cooked meat falls easily off the bone, but raw meat needs to be wrenched away. Carnosaurs (meat-eaters) needed their strong necks to help hold prey down. They also used the muscles in their necks to rip the meat from the carcass.

BONY NECKBAND

The neck is a vulnerable part of an animal's body – there are lots of important veins and muscles there. Ankylosaurs, such as *Edmontonia*, had solid rows of bony plates around their necks to protect them from hungry meat-eaters like *Albertosaurus*.

A dinosaur walked here

We can see where dinosaurs walked millions of years ago because they left footprints behind. Footprints give scientists important clues about how dinosaurs lived.

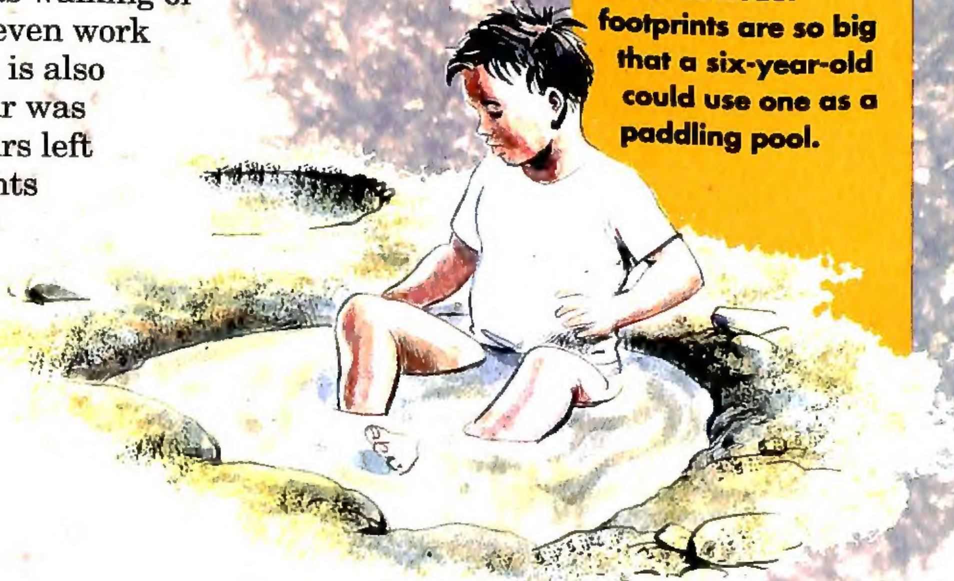
Dinosaur footprints made in mud or sand sometimes dried out and then fossilized. They are called 'trace fossils' because they are not part of an actual animal. Just as detectives can discover a lot from footprints left at the scene of a crime, palaeontologists can tell a great deal about dinosaurs from the footprints they left.

WE KNOW WHAT YOU'RE DOING!

From the different sizes and shapes of the footprints, experts can usually work out which kind of dinosaur made them. They can tell whether a dinosaur was walking or running. Sometimes they can even work out how fast a dinosaur ran. It is also possible to tell when a dinosaur was swimming. Big, heavy dinosaurs left large, deep footprints. Footprints of meat-eating dinosaurs were usually different from those of plant-eaters. Lots of tracks of the same kind in the same place often meant that a whole herd of dinosaurs had passed that way.

FIRST FOOTPRINTS

Three-toed footprints like the huge one on this page were discovered almost 200 years ago. They were among the first dinosaur fossils found in the USA. Scientists then thought they were made by gigantic, ancient birds.



Some dinosaur footprints are so big that a six-year-old could use one as a paddling pool.

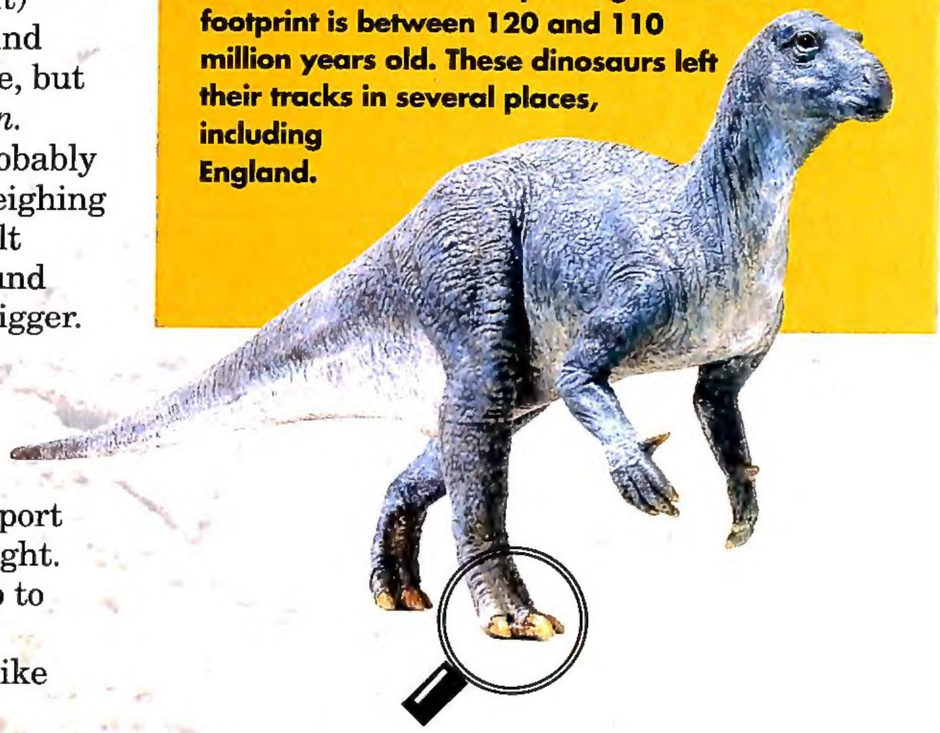
BABY FOOT

This is the footprint (left) made by *Iguanodon's* hind foot. It is almost life-size, but it is small for *Iguanodon.* Experts think it was probably made by a youngster weighing about half a tonne. Adult footprints have been found which are three times bigger.

BACK TRACK

Iguanodon's three-toed hind foot had to be strong enough to support the dinosaur's great weight. An adult could weigh up to two tonnes. It probably walked on its toes, just like modern cats and dogs.

The foot that made the print: *Iguanodon's* footprint is between 120 and 110 million years old. These dinosaurs left their tracks in several places, including England.

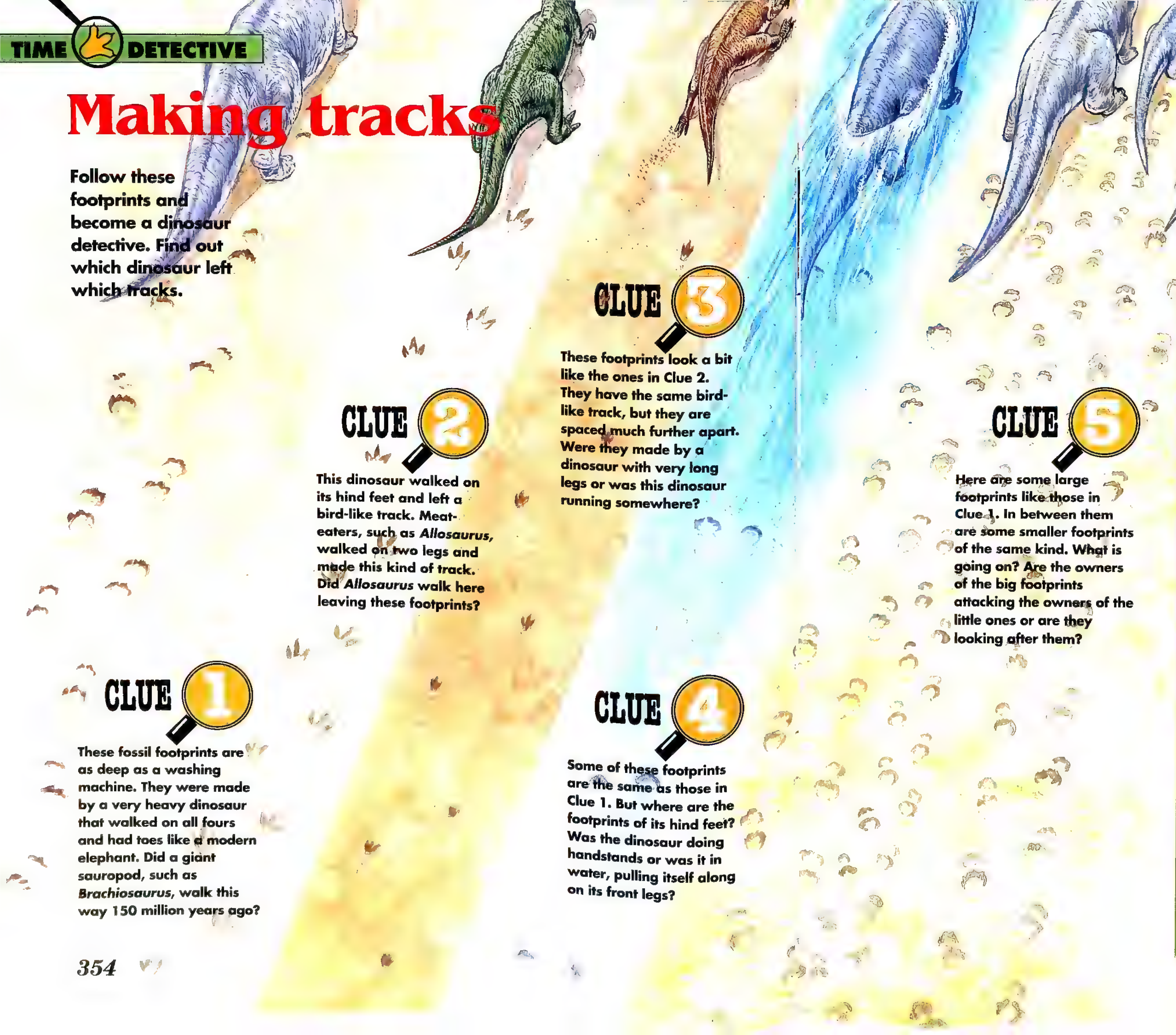


Footprints (above) scattered over rocks in Queensland, Australia. They were made by a big meat-eater chasing small plant-eaters across a river bed.

***Iguanodon* walked here (right). It left its footprints in soft mud which eventually became stone.**

Making tracks

Follow these footprints and become a dinosaur detective. Find out which dinosaur left which tracks.



CLUE 1

These fossil footprints are as deep as a washing machine. They were made by a very heavy dinosaur that walked on all fours and had toes like a modern elephant. Did a giant sauropod, such as *Brachiosaurus*, walk this way 150 million years ago?

CLUE 2

This dinosaur walked on its hind feet and left a bird-like track. Meat-eaters, such as *Allosaurus*, walked on two legs and made this kind of track. Did *Allosaurus* walk here leaving these footprints?

CLUE 3

These footprints look a bit like the ones in Clue 2. They have the same bird-like track, but they are spaced much further apart. Were they made by a dinosaur with very long legs or was this dinosaur running somewhere?

CLUE 4

Some of these footprints are the same as those in Clue 1. But where are the footprints of its hind feet? Was the dinosaur doing handstands or was it in water, pulling itself along on its front legs?

CLUE 5

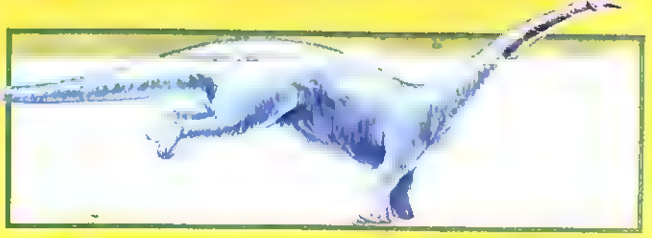
Here are some large footprints like those in Clue 1. In between them are some smaller footprints of the same kind. What is going on? Are the owners of the big footprints attacking the owners of the little ones or are they looking after them?

GOT IT!

① The first footprints belonged to the four-footed sauropod *Brachiosaurus*. It left them as it walked alone.

② The second footprints belonged to a two-legged dinosaur. These ones were made by a meat-eater like *Allosaurus*.

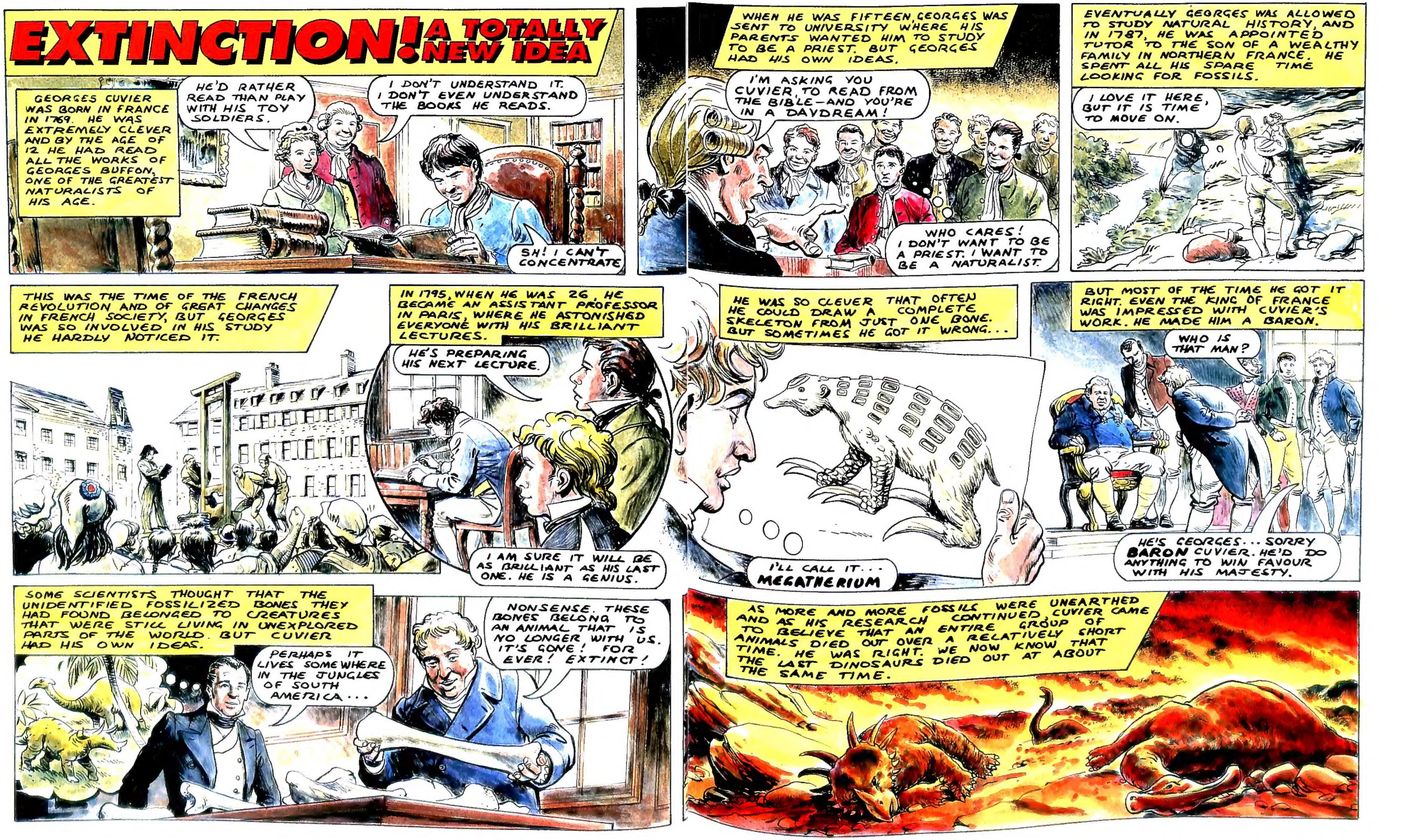
③ The third tracks were left by speedy *Gallimimus* as it ran flat out.



④ *Brachiosaurus* made the fourth set. It used its front legs to pull itself through water, its back feet trailed behind.

⑤ The last tracks were made by a herd of *Brachiosaurus*. Large adult tracks are on the outside, small tracks made by babies are on the inside. The young were safe in the middle.

EXTINCTION! A TOTALLY NEW IDEA


GEORGES CUVIER WAS BORN IN FRANCE IN 1769. HE WAS EXTREMELY CLEVER AND BY THE AGE OF 12 HE HAD READ ALL THE WORKS OF GEORGES BUFFON, ONE OF THE GREATEST NATURALISTS OF HIS AGE.
HE'D RATHER READ THAN PLAY WITH HIS TOY SOLDIERS.
I DON'T UNDERSTAND IT. I DON'T EVEN UNDERSTAND THE BOOKS HE READS.
SH! I CAN'T CONCENTRATE
WHEN HE WAS FIFTEEN, GEORGES WAS SENT TO UNIVERSITY WHERE HIS PARENTS WANTED HIM TO STUDY TO BE A PRIEST. BUT GEORGES HAD HIS OWN IDEAS.
I'M ASKING YOU CUVIER, TO READ FROM THE BIBLE—AND YOU'RE IN A DAYDREAM!
WHO CARES! I DON'T WANT TO BE A PRIEST. I WANT TO BE A NATURALIST.
EVENTUALLY GEORGES WAS ALLOWED TO STUDY NATURAL HISTORY, AND IN 1787, HE WAS APPOINTED TUTOR TO THE SON OF A WEALTHY FAMILY IN NORTHERN FRANCE. HE SPENT ALL HIS SPARE TIME LOOKING FOR FOSSILS.
I LOVE IT HERE, BUT IT IS TIME TO MOVE ON.
THIS WAS THE TIME OF THE FRENCH REVOLUTION AND OF GREAT CHANGES IN FRENCH SOCIETY, BUT GEORGES WAS SO INVOLVED IN HIS STUDY HE HARDLY NOTICED IT.
IN 1795, WHEN HE WAS 26, HE BECAME AN ASSISTANT PROFESSOR IN PARIS, WHERE HE ASTONISHED EVERYONE WITH HIS BRILLIANT LECTURES.
HE'S PREPARING HIS NEXT LECTURE.
I AM SURE IT WILL BE AS BRILLIANT AS HIS LAST ONE. HE IS A GENIUS.
HE WAS SO CLEVER THAT OFTEN HE COULD DRAW A COMPLETE SKELETON FROM JUST ONE BONE. BUT SOMETIMES HE GOT IT WRONG...
I'LL CALL IT... MEGATHERIUM
BUT MOST OF THE TIME HE GOT IT RIGHT. EVEN THE KING OF FRANCE WAS IMPRESSED WITH CUVIER'S WORK. HE MADE HIM A BARON.
WHO IS THAT MAN?
HE'S GEORGES... SORRY BARON CUVIER. HE'D DO ANYTHING TO WIN FAVOUR WITH HIS MAJESTY.
SOME SCIENTISTS THOUGHT THAT THE UNIDENTIFIED FOSSILIZED BONES THEY HAD FOUND BELONGED TO CREATURES THAT WERE STILL LIVING IN UNEXPLORED PARTS OF THE WORLD. BUT CUVIER HAD HIS OWN IDEAS.
PERHAPS IT LIVES SOMEWHERE IN THE JUNGLES OF SOUTH AMERICA...
NONSENSE. THESE BONES BELONG TO AN ANIMAL THAT IS NO LONGER WITH US. IT'S GONE! FOR EVER! EXTINCT!
AS MORE AND MORE FOSSILS WERE UNEARTHED AND AS HIS RESEARCH CONTINUED, CUVIER CAME TO BELIEVE THAT AN ENTIRE GROUP OF ANIMALS DIED OUT OVER A RELATIVELY SHORT TIME. HE WAS RIGHT. WE NOW KNOW THAT THE LAST DINOSAURS DIED OUT AT ABOUT THE SAME TIME.

Improve and test your knowledge with...

DINO Fact File

Fascinating dinosaur facts to read and 10 fun questions to answer.

Wingvitations

The strange supper organised by Hawkins and Owen that took place in the belly of a model Iguanodon had even stranger invitations. Instead of the usual card, guests were sent a life-size cardboard cut-out of a pterodactyl with the invitation written on the wings.

1 Which pterosaur combed the Cretaceous beaches?
a) *Quetzalcoatlus*
b) *Dsungaripterus*
c) *Pterodactylus*

2 What did *Anatotitan* use its tail for?
a) keeping cool
b) to signal to other hadrosaurs
c) to help it swim

3 What does *Daspletosaurus* mean?
a) strong-jawed lizard
b) curved-teeth lizard
c) frightful reptile

4 When *Elaphrosaurus* was found, which part of its skeleton was missing?
a) its tail
b) its head
c) its legs

5 What did people first think that dinosaur footprints belonged to?
a) a sauropod
b) a lizard
c) a bird

6 Which pterosaur was like a flying nutcracker?
a) *Dsungaripterus*
b) *Quetzalcoatlus*
c) *Tropeognathus*

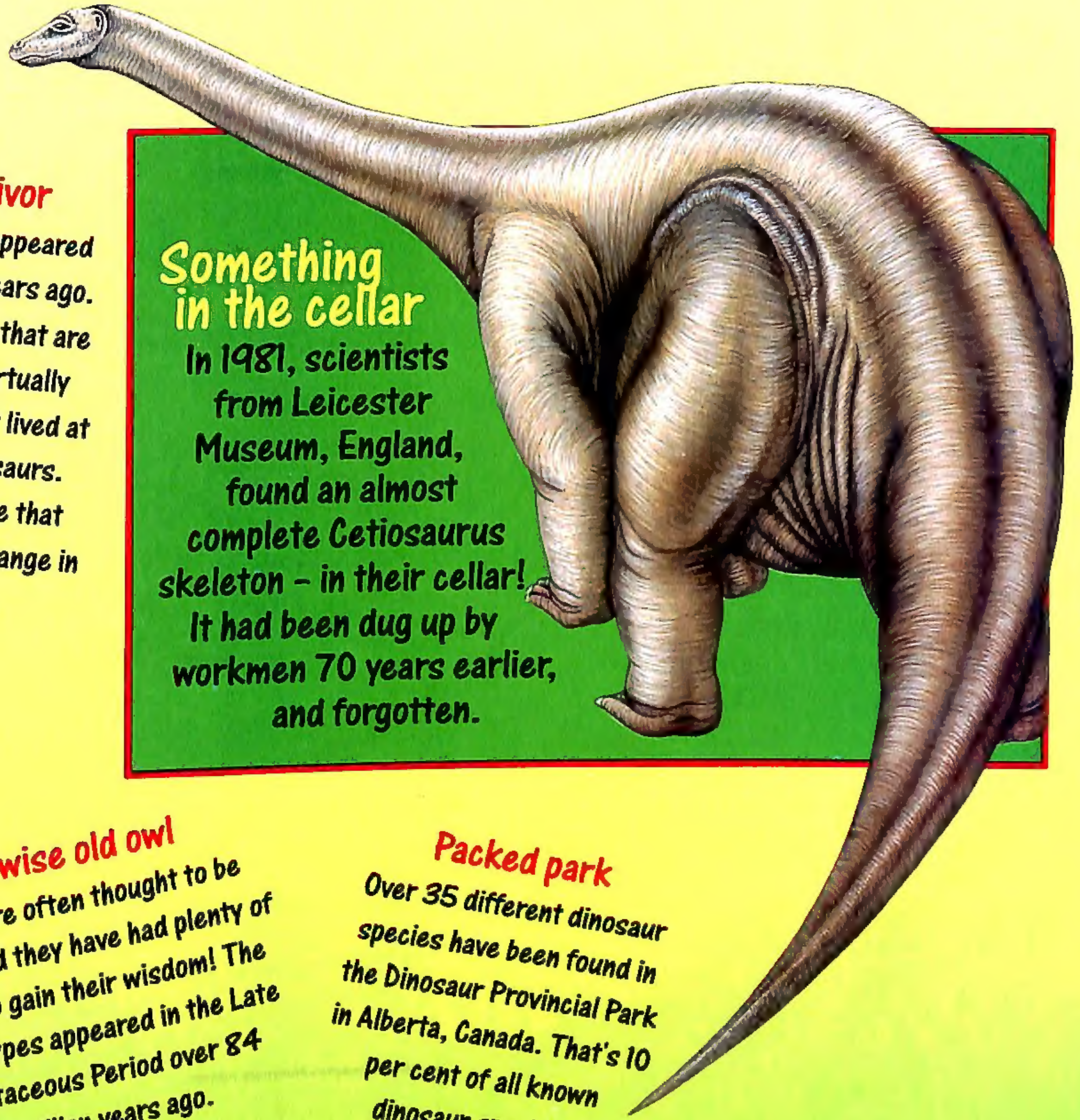
7 Where did *Tuojiangosaurus* live?
a) China
b) Japan
c) New Zealand

8 How many teeth did *Anatotitan* have?
a) about 500
b) about 1000
c) about 100

9 Which country was Georges Cuvier from?
a) Belgium
b) Switzerland
c) France

A true survivor

Cockroaches first appeared about 300 million years ago. Many of the species that are around today are virtually identical to those that lived at the time of the dinosaurs. They are so adaptable that they have not had to change in order to survive.



Something in the cellar

In 1981, scientists from Leicester Museum, England, found an almost complete Cetiosaurus skeleton – in their cellar! It had been dug up by workmen 70 years earlier, and forgotten.

A wise old owl

Owls are often thought to be wise, and they have had plenty of time to gain their wisdom! The first types appeared in the Late Cretaceous Period over 84 million years ago.

Packed park

Over 35 different dinosaur species have been found in the Dinosaur Provincial Park in Alberta, Canada. That's 10 per cent of all known dinosaur species!

Flower power

Dinosaurs may have helped flowers to evolve. By the Cretaceous Period, there were so many plant-eaters feeding near the ground that they wiped out whole meadows wherever they went. The non-flowering plants did not grow back as quickly as the flowering ones and these took their place.

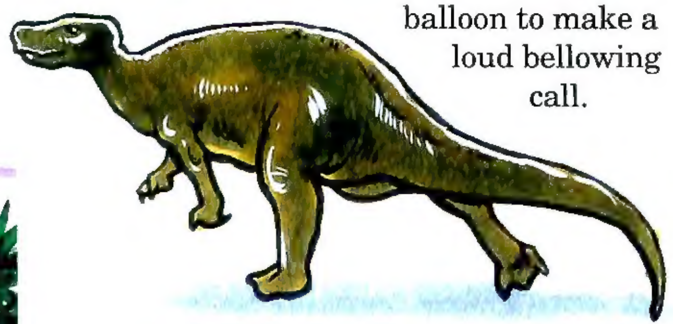
10 How many neck bones did *Mamenchisaurus* have?
a) 9
b) 19
c) 91

Answers to the questions on inside back cover

A to Z OF DINOSAURS

EDMONTOSAURUS **70 MYA**

Longer than the net of a tennis court, *Edmontosaurus* (ed-mont-oh-saw-rus) was one of the biggest of the duckbilled dinosaurs. It lived in the Late Cretaceous Period in North America and fed on plants. *Edmontosaurus* had a long tail to balance the front of its body and could walk on two or four legs. Inside its skull, *Edmontosaurus* had hundreds of teeth that were closely packed together to grind down tough plants. Above its nostrils, there was an area of loose skin that inflated like a balloon to make a loud bellowing call.



ELAPHROSAURUS **150 MYA**

Elaphrosaurus (ee-laf-roh-saw-rus), meaning 'light-weight reptile', lived in Tanzania, Africa, in the Late Jurassic Period. When its skeleton was found in 1920, it had no head, so we do not know for sure if *Elaphrosaurus* had teeth or a sharp beak like the ornithomimosaurs that lived 70 million years later. It had good balance and ran fast, rather like ostriches do today. About as long as an average car and as tall as an adult human, *Elaphrosaurus* walked on long, slender back legs.

MYA = MILLION YEARS AGO

ELMISAURUS **80 MYA**

Very little is known about *Elmisaurus* (el-mi-saw-rus). Parts of its hands, bird-like feet and a few leg bones have been found in Mongolia and Alberta, Canada. It lived in the Late Cretaceous Period. *Elmisaurus* was a lightly built dinosaur, no longer than a small car. Its name means 'foot reptile'.

ENIGMOSAURUS **80 MYA**

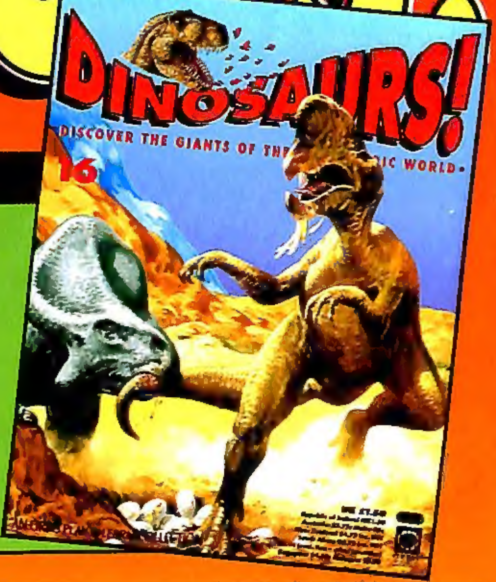
'Mysterious reptile' is a good name for this dinosaur. It lived in the Late Cretaceous Period in south-east Mongolia. Only the skull, jaws and hip bones of slender *Enigmosaurus* (e-nig-mo-saw-rus) have been found. But we know that it would have just fitted between a pair of football goal-posts.

EOCERATOPS **75 MYA**

It is possible that *Eoceratops* (ee-oh-serra-tops) was really a young horned dinosaur named *Chasmosaurus*. When it was found in Alberta, Canada, part of its skull was missing. Scientists know that *Eoceratops* had a short nose horn and two longer horns that curved backward from its brow. Like other horned dinosaurs, it walked on four legs and ate plants. *Eoceratops* means 'dawn-horned face'.

COMING IN PART 16 OF

DINOSAURS!



Meet toothless *Oviraptor*, the burglar of the dinosaur world, in IDENTIKIT – along with spiky *Polacanthus* and chunky, tree-topping *Opisthocoelicaudia*

PLUS

DINOSAUR MODEL: The next piece for your *T rex* body model.

And

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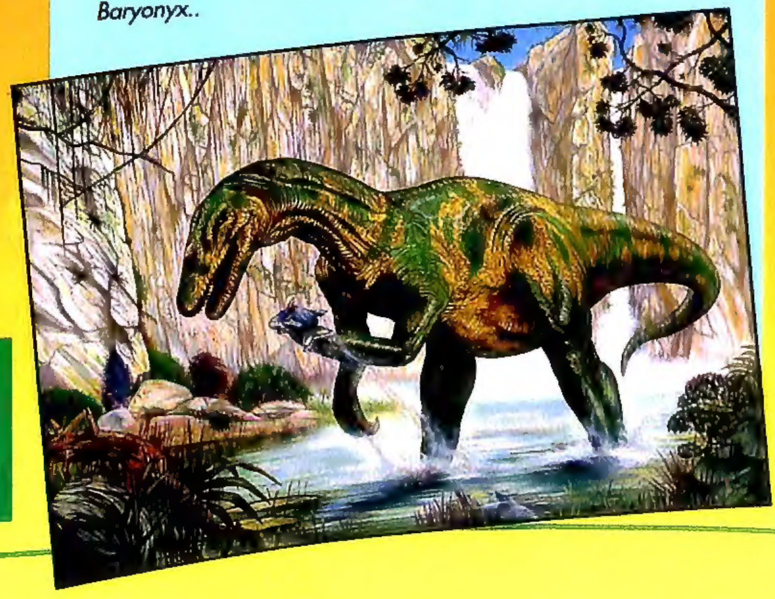
THE DINOSAURS! POSTER COLLECTION

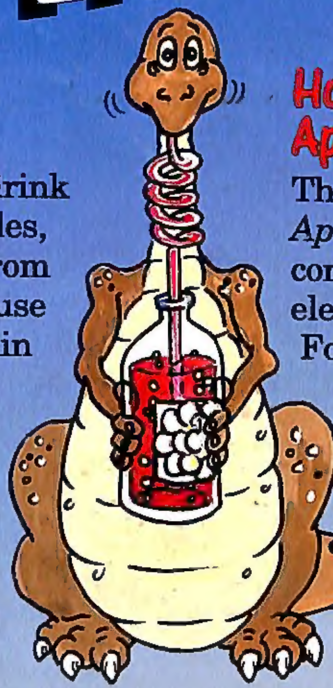
Have you ever wanted to fill your room with dinosaurs? Now you have your chance – with the *Dinosaurs!* POSTER COLLECTION. Each poster is a 820 x 570mm (nearly eight times the size of this page) and features a superb dinosaur artwork. You'll find facts and figures about the dinosaur on the back – PLUS a look at some other prehistoric animals. The sixth poster is *Baryonyx*..



ANSWERS TO DINO FACT FILE QUESTIONS: 1.b, 2.c, 3.c, 4.b, 5.c, 6.a, 7.a, 8.b, 9.c, 10.b

Dr. David Norman of Cambridge University answers your dinosaur questions

ASK THE EXPERT



How much water did dinosaurs drink?

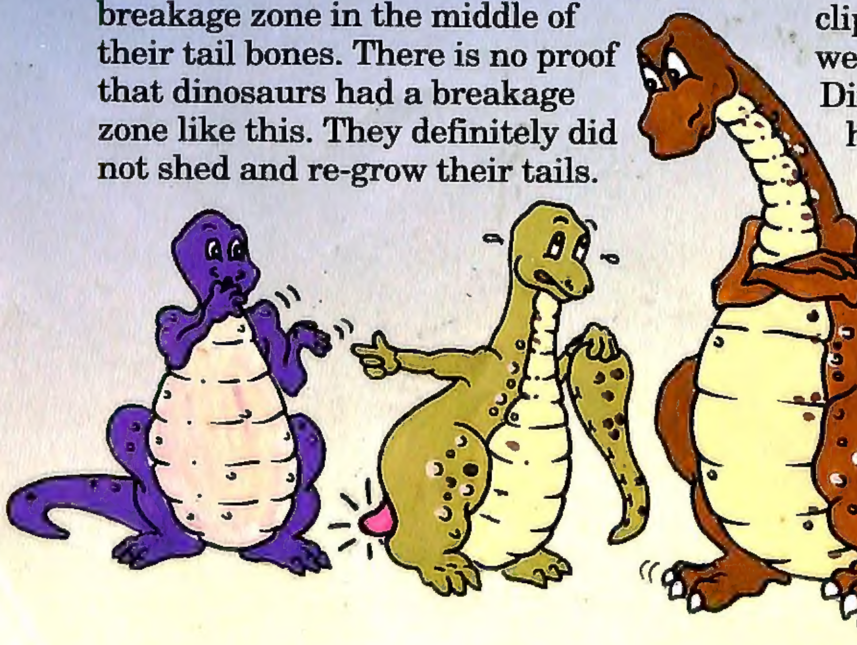
Dinosaurs did not need to drink very much. Like most reptiles, they lost very little water from their bodies. This was because they did not sweat (their skin was tough and waterproof) and they did not pass water as urine but as a paste, like bird droppings. They got most of their water from the things they ate, such as plants or other animals.

How much food did Apatosaurus eat in one day?

There is no way of knowing how much food *Apatosaurus* may have eaten. We can compare this huge dinosaur with today's elephant. This is not very helpful, though. For example, a two-tonne elephant eats over 100kg of food a day. *Apatosaurus,* which may have weighed as much as 10 elephants, may have eaten the same amount as an elephant – or much more. The real answer, of course, is that we don't know for sure.

Could any dinosaurs re-grow their tails, like lizards?

No, they could not. Lizards have a special breakage zone in the middle of their tail bones. There is no proof that dinosaurs had a breakage zone like this. They definitely did not shed and re-grow their tails.



Did dinosaurs' claws ever get in the way, like budgies'?

Budgies that are kept in cages need to have their claws clipped because they do not wear them down naturally. Dinosaurs would not have had this problem, they would have naturally worn their claws down in the wild.